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Memo

DATE: *November 9, 2001*

TO: RHIC E-Coolers

FROM: *Ady Hershcovitch*

SUBJECT: **Minutes of the November 9, 2001 Meeting**

Present: Ilan Ben-Zvi, Ady Hershcovitch, Jorg Kewisch, William MacKay, Stephen Peggs, Thomas Roser, Dejan Trbojevic, Dong Wang, Jie Wei.

Topics discussed: Cheaper Components, Electron Gun, Beam Dump, Simulation Codes.

Cheaper Components: before bidding on the Boeing beam dump, it should be examined, since it is most likely activated. It may be hazardous and its transportation too expansive.

Electron Gun: Northrop Grumman management authorized work on a potential job for BNL and/or AES. Most likely scenario, BNL will handle electron gun cathode and RF; AES will be dealing directly with Northrop Grumman regarding electron gun cooling.

Beam Dump: the cost of a ½ MW beam dump, built by Northrop Grumman would be about $50K. It is a very rough estimate, which can vary by "$25K. However, an "off-the-shelf" beam dump will most likely cost $25K or less. A concern regarding proper power distribution over the beam stop surface was raised. To assure proper beam spreading a perveance P>1.5 microperv is needed. At 4 A 5 MeV beam P = 3.6×10^{-4} microperv. A magnetic system to defocus the beam will be required. Waldo, Ilan, and Steve raised the issue of accidental dumping of the high energy beam, for which a system to defocus the low energy beam would be ineffective. Although the maximum energy is 4 joules per cavity (without energy recovery), the instantaneous power could be large. Experience at CEBAF with a 1 MW beam dump suggests that large power can be absorbed for 10's of microseconds before damage occurs. **This issue must be addressed**.

Simulation Codes: Dong started to report on the status of lattice calculations. Dong compared SIMCOOL, BETACOOL, and the use of Parkhomchuk or Derbenev formulas. Ady suggested examining velocity space relaxation formulas (derived for fusion plasmas by Judd, MacDonald & Rosenbluth; good description can be found in books by Trubnikov or Braginskii). After the meeting, in a discussion among Ady, Dong, Ilan, & Jorg it became clear that plasma physics formulas can't be used since the Debye length < beam diameter. So far simulations indicate that the issue of the merging beams has yet to be resolved, since different strength fields are needed for low & high energy beams. Dong's report to be continued.